

CLAIMS

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1. A low pressure, ~~early suppression~~ fast response sprinkler comprising:
 - a generally tubular body having an inlet end, an opposing discharge end and an internal passageway extending between the inlet and discharge ends with a K factor greater than 16 where the K factor equals the flow of water in gallons per minute through the internal passageway divided by the square root of the pressure of water fed into the tubular body in pounds per square inch gauge;
 - a deflector coupled with the tubular body and spaced from and generally aligned with the discharge end of the internal passageway so as to be impacted by a flow of water issuing from the discharge end of the passageway upon activation of the sprinkler, the deflector being configured and positioned to deflect the flow of water generally radially outwardly all around the sprinkler;
 - a closure releasably positioned at the discharge end of the tubular body so as to close the internal passageway; and
 - a heat responsive trigger mounted to releasably retain the closure at the discharge end of the tubular body, the trigger having a response time index of less than 100 meter $\frac{1}{2}$ sec $\frac{1}{2}$ (m $\frac{1}{2}$ sec $\frac{1}{2}$).
2. The sprinkler of claim 1, wherein the K factor is between 18 and 40.
3. The sprinkler of claim 2, wherein the K factor is greater than 20.
4. The sprinkler of claim 3, wherein the K factor is between 22 and 26.
5. The sprinkler of claim 1, wherein the response time index is less than 80.0 m $\frac{1}{2}$ sec $\frac{1}{2}$.

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6. The sprinkler of claim 5, wherein the response time index is less than $40 \text{ m}^{\frac{1}{2}} \text{sec}^{\frac{1}{2}}$.

7. The sprinkler of claim 2, wherein the response time index is less than $80.0 \text{ m}^{\frac{1}{2}} \text{sec}^{\frac{1}{2}}$.

8. The sprinkler of claim 7, wherein the response time index is less than $40 \text{ m}^{\frac{1}{2}} \text{sec}^{\frac{1}{2}}$.

9. The sprinkler of claim 3, wherein the response time index is less than $80.0 \text{ m}^{\frac{1}{2}} \text{sec}^{\frac{1}{2}}$.

10. The sprinkler of claim 9, wherein the response time index is less than $40 \text{ m}^{\frac{1}{2}} \text{sec}^{\frac{1}{2}}$.

11. The sprinkler of claim 4, wherein the response time index is less than $80.0 \text{ m}^{\frac{1}{2}} \text{sec}^{\frac{1}{2}}$.

12. The sprinkler of claim 11, wherein the response time index is less than $40 \text{ m}^{\frac{1}{2}} \text{sec}^{\frac{1}{2}}$.

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13. The sprinkler of ~~claim~~^{any of} 1, wherein the internal passageway includes a central axis and wherein the deflector includes an opening located along the central axis, the opening extending axially entirely through the deflector so as to permit passage of water axially entirely through the deflector along the central axis.

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14. The sprinkler of ~~claim~~^{any of} 1, wherein the deflector includes a plate member having a circular outer perimeter with an outer diameter and a plurality of slots extending inwardly from the outer perimeter and axially entirely through the plate member, the slots surrounding a circular slotless central area of the plate member, and

the tubular body having a minimum central passageway diameter greater than a maximum diameter of the slotless central area.

15. The sprinkler of claim 14 wherein a ratio of the minimum central passageway diameter to the circular central area diameter is greater than 1.3.

16. The sprinkler of claim 14 wherein a ratio of the minimum central passageway diameter to the circular central area diameter is at least about 1.5.

17. The sprinkler of claim 1, wherein the internal passageway of the tubular body has a minimum orifice diameter greater than 0.75 inches.

18. The sprinkler of claim 1, wherein the internal passageway of the tubular body has a minimum orifice diameter greater than 0.85 inches.

19. The sprinkler of claim 1, wherein the internal passageway of the tubular body has a minimum orifice diameter between 0.75 and 1.2 inches.

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